

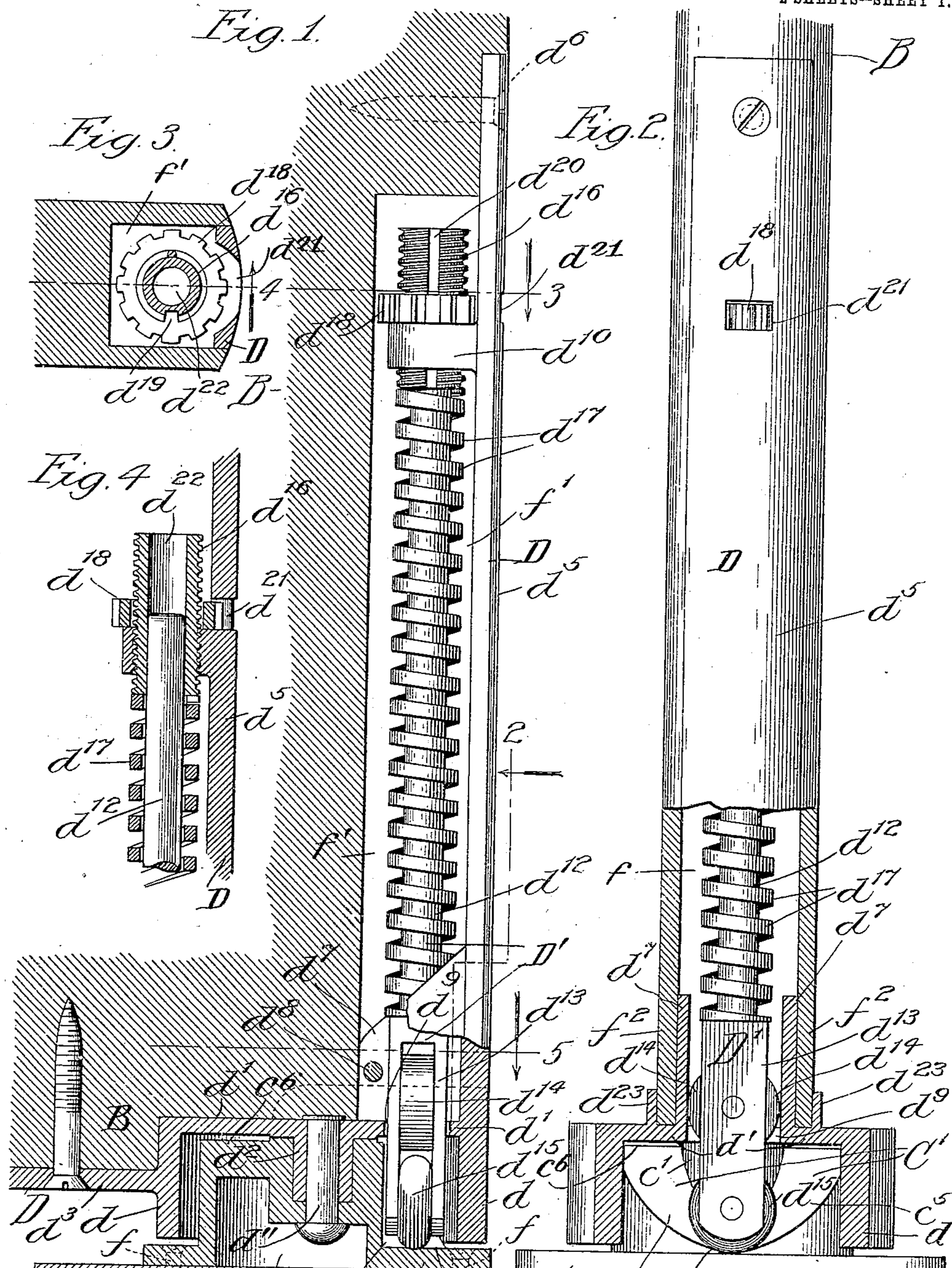
HINGE.

APPLICATION FILED APR. 16, 1908.

**923,400.**

Patented June 1, 1909.

2 SHEETS--SHEET 1.



Witnesses:  $C^3$   $C^1$   $C$   $C^4$   
John Enders  $A$   
Chas. H. Buell

Inventor:  
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2 SHEETS—SHEET 2.

Fig. 5.

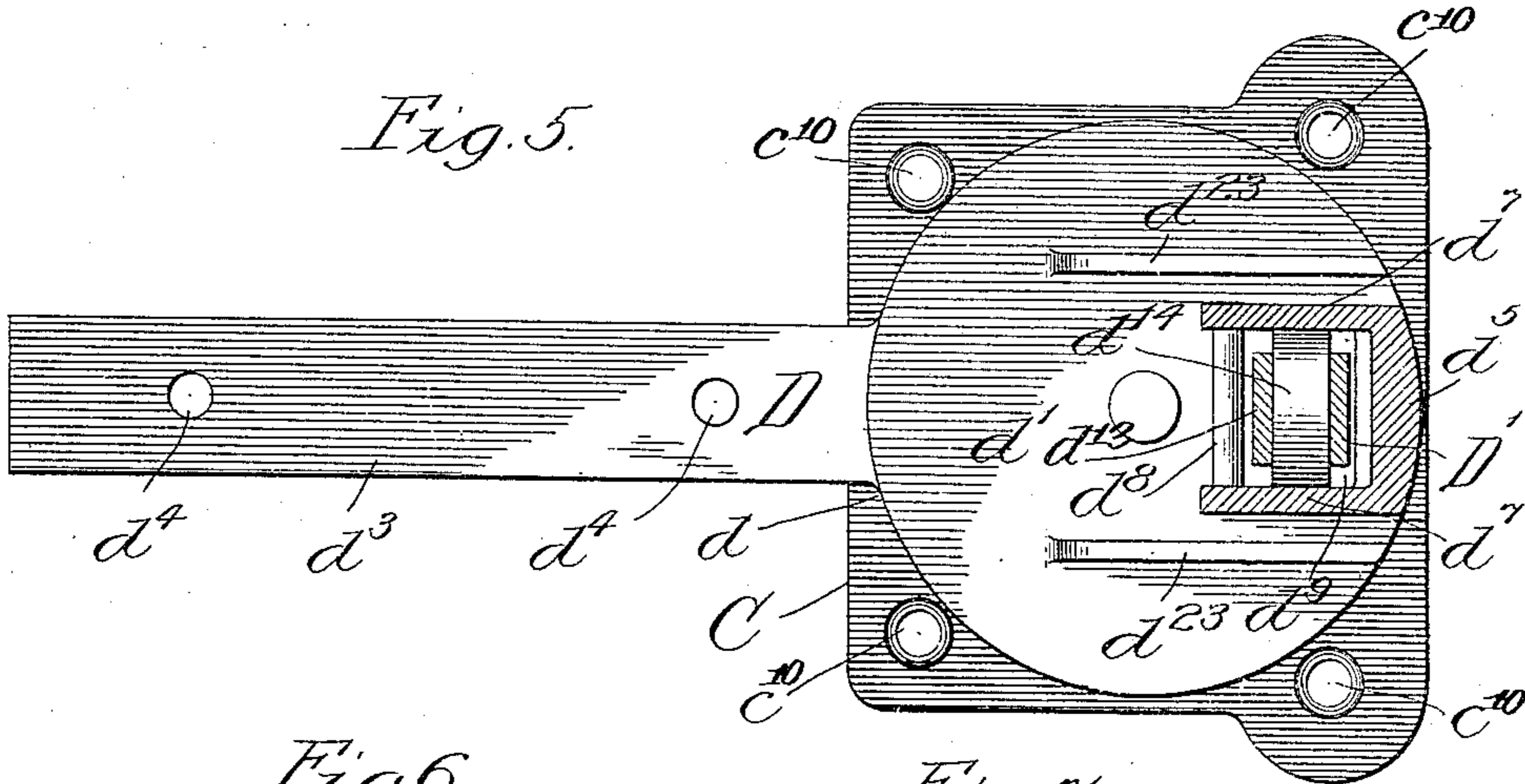


Fig. 6.

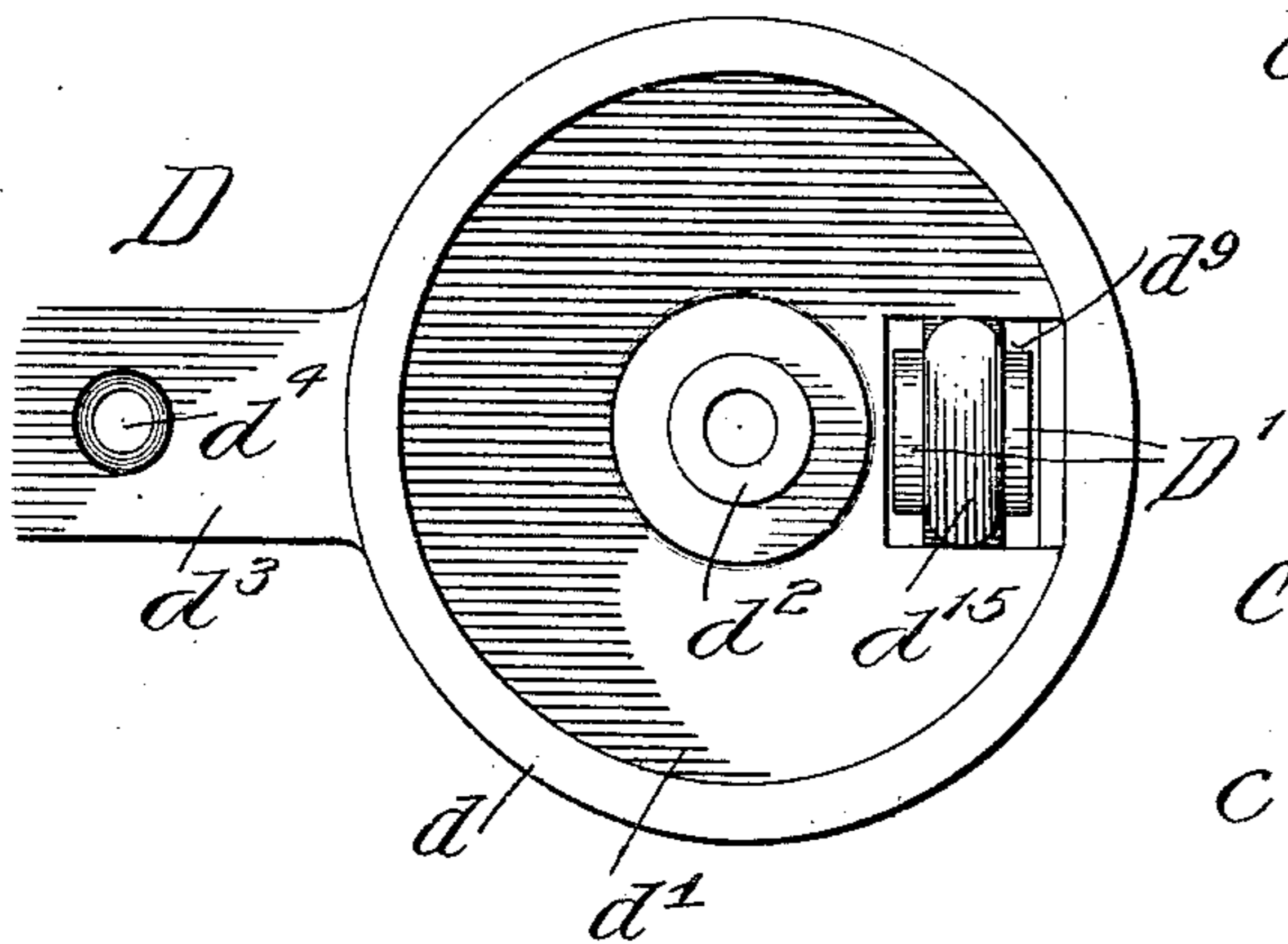


Fig. 7.

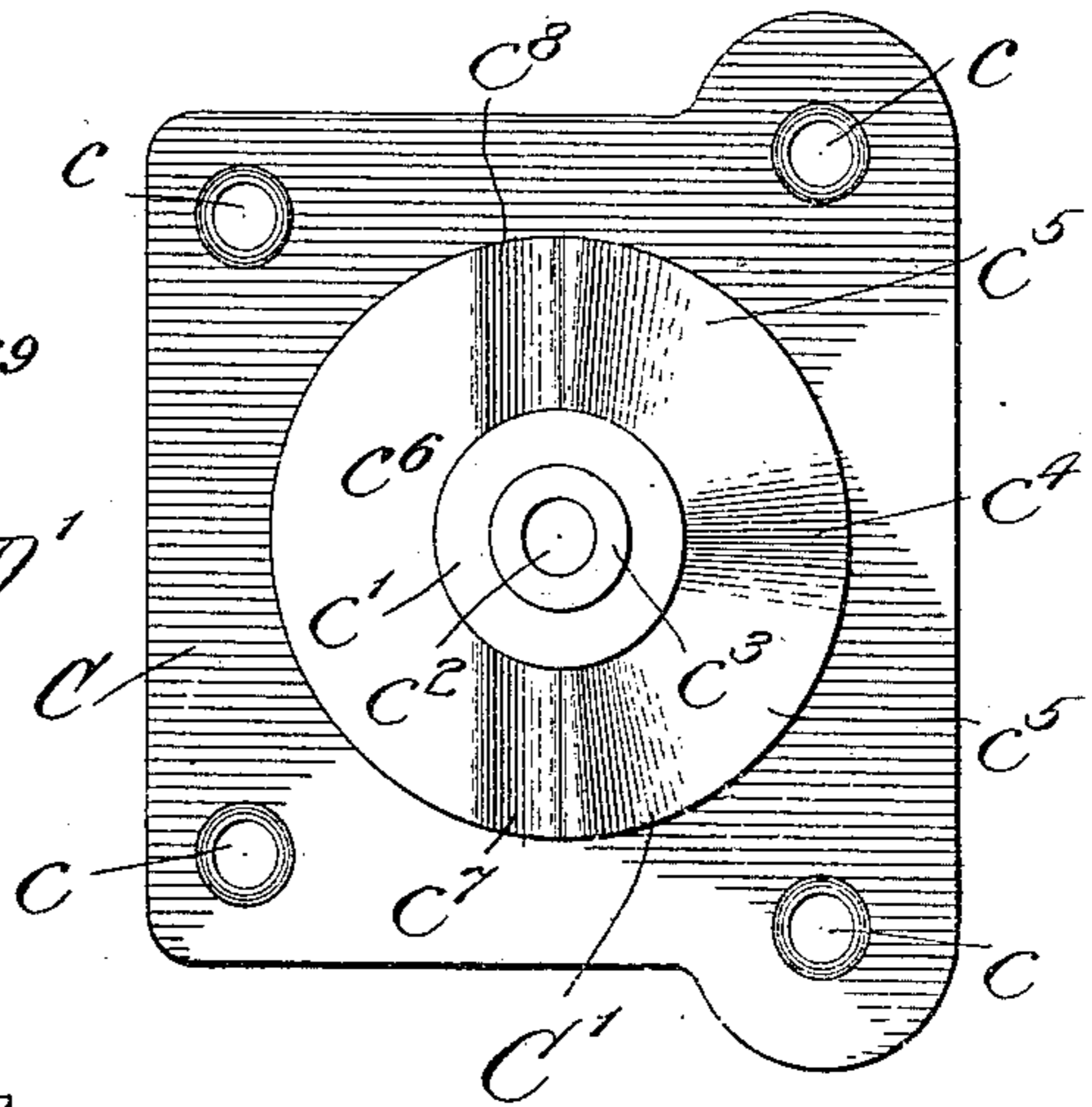
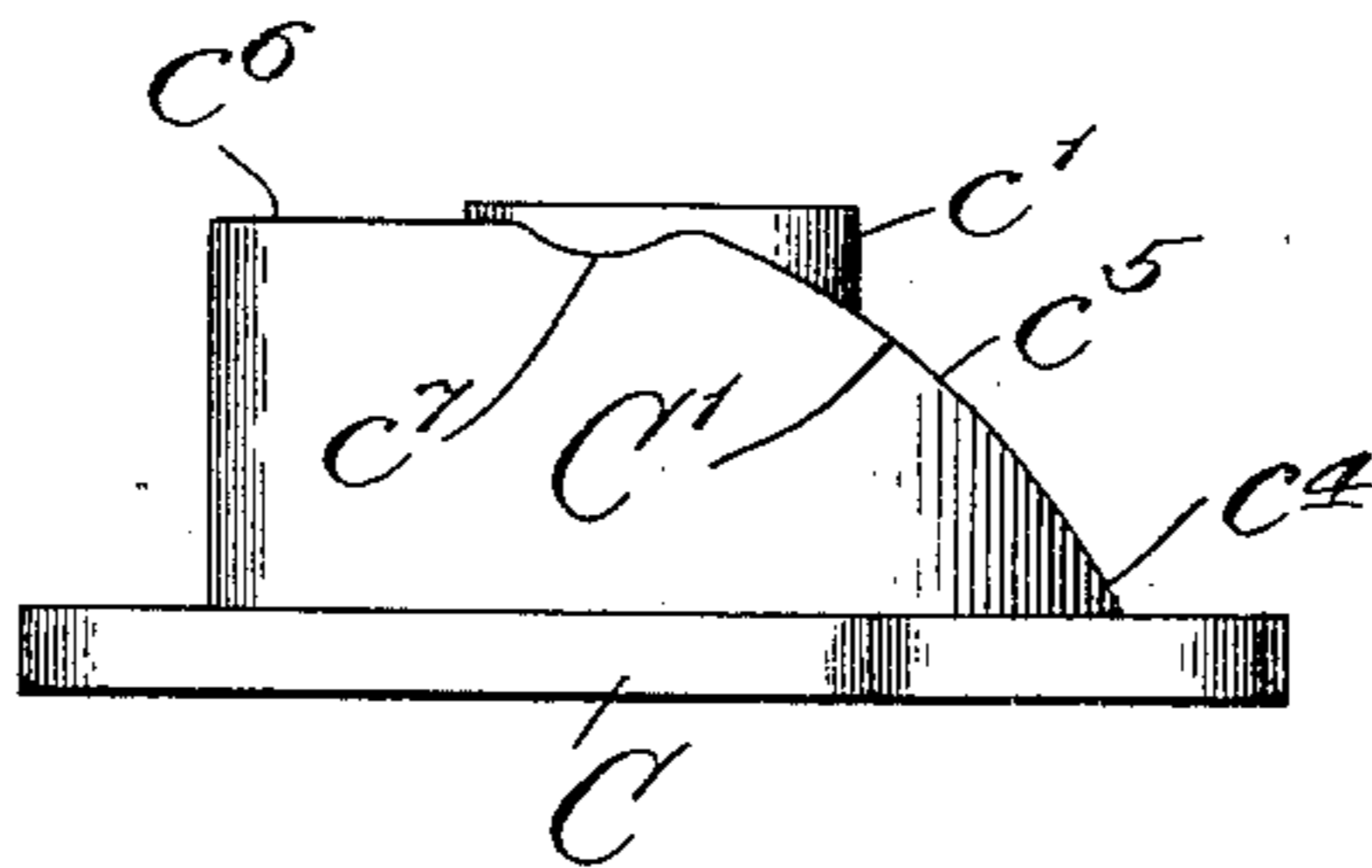


Fig. 8.



Witnesses:

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# UNITED STATES PATENT OFFICE.

JOHN E. AHLVIN, OF JOLIET, ILLINOIS.

## HINGE.

No. 923,400.

Specification of Letters Patent.

Patented June 1, 1909.

Application filed April 16, 1908. Serial No. 427,444.

*To all whom it may concern:*

Be it known that I, JOHN E. AHLVIN, a citizen of the United States, residing at Joliet, in the county of Will and State of Illinois, have invented a new and useful Improvement in Hinges, of which the following is a specification.

My invention relates particularly to hinges for doors capable of swinging in two directions, such as butler's pantry doors; and my primary object is to provide an improved hinge capable of maintaining the door in either of three positions, of durable and comparatively inexpensive construction and capable of being readily applied.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 represents a broken vertical sectional view of a door and my improved hinge applied thereto; Fig. 2, a rear elevational view of the improved hinge, partly in section, the section being taken as indicated at line 2 of Fig. 1; Fig. 3, a broken sectional view taken as indicated at line 3 of Fig. 1; Fig. 4, a broken vertical section taken as indicated at line 4 of Fig. 3; Fig. 5, a horizontal sectional view of the hinge taken as indicated at line 5 of Fig. 1; Fig. 6, a broken bottom view of that portion of the hinge which is carried by the door; Fig. 7, a plan view of the cam-equipped floor-plate employed; and Fig. 8, a side elevational view of the same.

In the construction illustrated, A represents the floor; B, a swinging-door; C, a floor-plate, or hinge-member, equipped with a cam  $C^1$ ; D, a heel-plate, or hinge-member, connected with the door; and  $D^1$ , a roller-equipped spring-held yoke connected with the heel-plate and co-acting with the cam  $C^1$  of the floor-plate.

The floor-plate C comprises a rectangular member provided near its corners with screw-openings  $c$ ; a central pivot boss  $c^1$ ; and the annular cam  $C^1$  encircling the central pivot-boss. The pivot-boss  $c^1$  is provided with a central perforation  $c^2$  and a counter-sink, or bore,  $c^3$ . The cam  $C^1$  is provided at its rear portion with a deep depression  $c^4$  flanked by gradual inclines  $c^5$  which rise to meet a horizontal surface  $c^6$ . At the junctions between the inclines  $c^5$  and the horizontal surface  $c^6$  are depressions  $c^7$ ,  $c^8$  located on opposite sides of the pivot-lug  $c^1$ . One or the

other of the depressions  $c^7$ ,  $c^8$  serves to receive the roller  $d^{15}$  when the door is in a wide-open position, depending upon which way the door is opened. As shown in Fig. 3, the floor-plate is provided on its lower side, beneath the high portion of the cam and the pivot-lug  $c^1$ , with a chamber  $c^9$  adapted to receive a head of a rivet which serves to connect the hinge-members together.

The heel-plate D comprises a barrel  $d$  adapted to encircle the cam  $C^1$  and having a top  $d^1$  equipped on its lower surface with a pivot-boss  $d^2$  fitting in the bore of the pivot-boss  $c^1$ ; a forwardly extending flange, or arm,  $d^3$  projecting from the front wall of the barrel  $d$  and provided with screw-holes  $d^4$  adapted to receive screws entering the lower edge of the door; an upwardly extending arm  $d^5$  rising from the rear portion of the barrel  $d$  and provided with a screw-hole  $d^6$  receiving a screw adapted to enter the rear edge of the door; guide-flanges  $d^7$  projecting forwardly from the base-portion of the member  $d^5$  and joined at their front edges by a rivet  $d^8$  adapted to prevent separating of the flanges, the wall  $d^1$  of the barrel  $d$  being cut away between said guide-flanges to afford a slot  $d^9$  through which the spring-held yoke  $D^1$  projects, as is shown in Figs. 1 and 2; and a nut  $d^{10}$  cast integrally with the member  $d^5$  at the front vertical surface thereof near the top of said member. The pivot-lug  $d^2$  and the horizontal wall  $d^1$  by which it is carried are provided with a perforation in alinement with the perforation  $c^2$  of the floor-plate, and the floor-plate and heel-plate of the door are connected together by a pivot  $d^{11}$  which may be in the form of a rivet, as shown. The heel-plate is secured to the door by screws passing through holes  $c^{10}$  in a flange surrounding the barrel  $d$ , see Fig. 5.

The member  $D^1$  preferably comprises a stem, or guide-rod,  $d^{12}$  equipped at its lower end with a yoke  $d^{13}$  in which is journaled a guide-roller  $d^{14}$  and a cam-roller  $d^{15}$ ; an externally threaded sleeve  $d^{16}$  extending through the nut  $d^{10}$ ; a coil-spring  $d^{17}$  confined between the lower end of the member  $d^{16}$  and the upper end of the yoke  $d^{13}$ ; and an externally notched collar  $d^{18}$  resting on the fixed nut  $d^{10}$  and provided internally, as shown in Fig. 3, with a lug  $d^{19}$  which is received by a vertical slot  $d^{20}$  with which the threaded

sleeve, or tubular screw  $d^{16}$  is provided. At the point where the collar  $d^{18}$  is located, the vertical member  $d^5$  of the heel-plate is provided with a slot  $d^{21}$  into which the peripheral portion of the collar  $d^{18}$  projects. The upper end of the rod, or shank  $d^{12}$  of the member  $D^1$  projects into the bore  $d^{22}$  of the tubular screw  $d^{16}$ , as shown in Fig. 4.

As will be understood most readily from Fig. 2, the axes of the guide-roller  $d^{14}$  and the roller  $d^{15}$  are horizontally disposed and located in the plane of the door, the guide-roller being confined between the guide-flanges  $d^7$  and the cam-roller  $d^{15}$  resting normally on the low point  $c^4$  of the cam  $C^1$ .

The floor-plate is secured to the floor by means of screws  $f$  passing through the perforations  $c$ . The rear lower corner of the door is recessed to accommodate the barrel  $d$ , and the rear edge of the door is mortised to provide a recess  $f^1$  adapted to receive the rear vertical member  $d^5$  of the heel-plate and the attendant parts. By preference, the upper surface of the top wall  $d^1$  of the barrel  $d$  is equipped with flanges  $d^{23}$  extending parallel with the guide-flanges  $d^7$  and spaced a short distance therefrom, as best shown in Fig. 5. When the door is mortised to receive the heel-plate, narrow portions  $f^2$  of the door flanking the recess  $f^1$  are left, and these narrow portions are received between the guide-flanges  $d^7$  and the flanges  $d^{23}$ . Thus the flanges  $d^{23}$  afford metal bindings adapted to prevent splintering of the thin portions of the wood.

From the foregoing detailed description the operation will be readily understood. The cam-roller  $d^{15}$  rests normally on the low portion  $c^4$  of the cam  $C^1$ , the spring  $d^{17}$  being normally under tension and the door being thus held normally in its closed position. When the door is swung in one direction, the cam-roller mounts one of the inclines  $c^5$  of the cam  $C^1$  and enters one of the recesses  $c^7$ ,  $c^8$ , according to the direction in which the door is swung, thereby locking the door in the open position. Should it be desired to increase or decrease the tension of the spring  $d^{17}$ , this may be effected by swinging the door to a wide-open position and turning the member  $d^{18}$  by means of an instrument inserted through the slot  $d^{21}$  of the vertical arm  $d^5$  of the heel-plate. When the member  $d^{18}$  is turned, it rotates the tubular screw  $d^{16}$ , thereby causing the screw to raise or lower, as the case may be, to change the tension of the spring.

It is noteworthy that the improved automatic hinge may be applied to a door with but very little mortising of the door; and it may be stated that the device is thoroughly durable and absolutely reliable in operation. By arranging the cam  $C^1$  with its low point at the rear edge of the door, it

is possible to arrange the spring-held yoke-member  $D^1$  in close juxtaposition to the vertical arm  $d^5$  of the heel-plate, thus rendering it unnecessary to mortise the door deeply.

The foregoing detailed description has been given for clearness of understanding only, and no undue limitation is to be understood therefrom.

What I regard as new, and desire to secure by Letters Patent, is—

1. The combination with a floor-plate provided on its upper surface with a cam, of a heel-plate pivotally connected with said floor-plate and equipped with a vertical member adapted for attachment to the rear edge of a door, a guide adjacent the base portion of the vertical member of said heel-plate, a plunger equipped with a roller engaging said guide and equipped also with a roller engaging said cam, and a spring yieldingly holding said plunger in a depressed position.

2. The combination with a floor-plate provided on its upper surface with an annular cam, of a heel-plate pivotally connected with said floor-plate and equipped with a vertical arm adapted for connection with the rear edge of a door, a plunger adjacent the vertical arm of said heel-plate equipped at its lower end with cam-engaging means, a spring normally depressing said plunger, and an adjusting screw at the upper end of said spring connected with said vertical arm of said heel-plate.

3. The combination with a floor-plate provided on its upper surface with an annular cam, of a heel-plate pivotally connected with said floor-plate and equipped with a vertical arm adapted for connection with the rear edge of a door, a plunger adjacent the vertical arm of said heel-plate equipped at its lower end with cam-engaging means, a spring normally depressing said plunger, an adjusting screw at the upper end of said spring connected with said vertical arm of said heel-plate, and screw-rotating means accessible from the rear of said vertical arm.

4. The combination with a floor-plate equipped with a cam, of a heel-plate pivotally connected with said floor-plate and equipped with a vertical arm adapted for connection with the rear edge of a door, a nut carried by said vertical arm, a hollow screw in said nut, a plunger extending into said hollow screw and equipped at its lower end with cam-engaging means, and a spring bearing on said plunger and engaging said screw.

5. The combination with a floor-plate equipped with a cam, of a heel-plate pivotally connected with said floor-plate and equipped with a vertical arm adapted for connection with the rear edge of a door;

guide-flanges projecting forwardly from the lateral edge portions of said vertical arm at the base thereof, a nut carried by the upper portion of said vertical arm, a plunger  
5 equipped with a roller engaging said guide-flanges and equipped beneath said first-named roller with another roller engaging said cam, a spring encircling said plunger,

a screw received by said nut and engaging said spring, and screw-rotating means accessible from the rear of said vertical arm. 10

JOHN E. AHLVIN.

In presence of—

L. HEISLAR,  
R. SCHAEFER.